

ENV

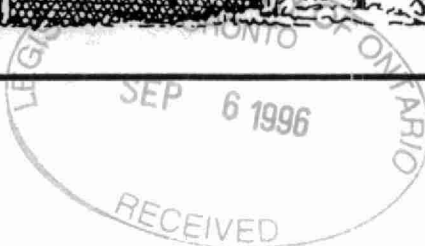
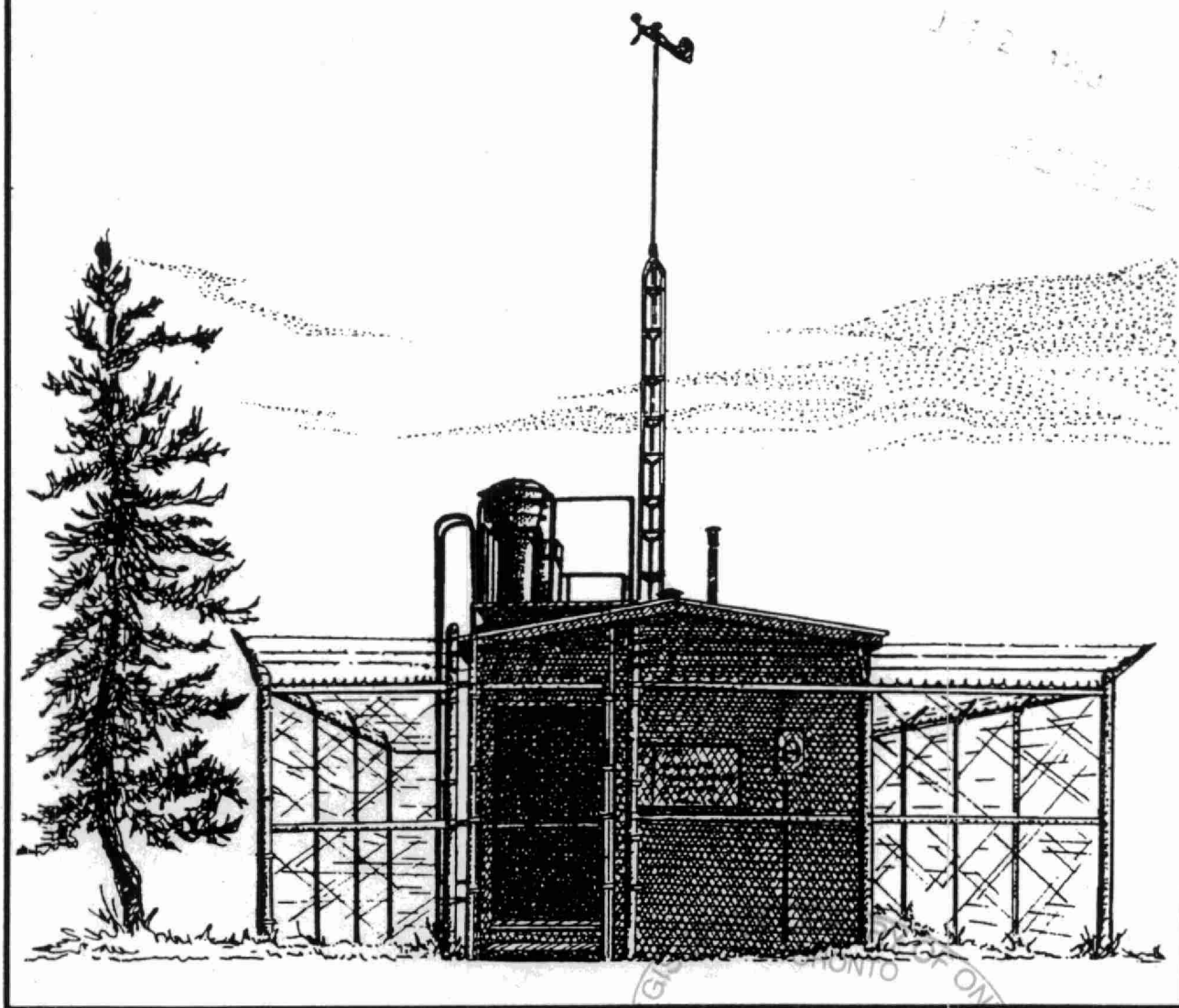
✓
ANN 93

CA2 ON
EVR 125

A369

AIR QUALITY ASSESSMENT THUNDER BAY TERMINALS LIMITED THUNDER BAY, 1992

MARCH, 1993.



Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

**AIR QUALITY ASSESSMENT
THUNDER BAY TERMINALS LIMITED,
THUNDER BAY,
1992**

**Dennis Griffin
Chief, Air Quality Assessment**

**Don Racette
Environmental Scientist**

**TECHNICAL ASSESSMENT SECTION
NORTHWESTERN REGION
ONTARIO MINISTRY OF THE ENVIRONMENT**

March, 1993

INTRODUCTION

Since 1978, Thunder Bay Terminals Limited has operated a bulk storage and transfer facility adjacent to Thunder Bay harbour. For the past 14 years, air quality assessment studies (including air quality monitoring, vegetation, soil and snow sampling) have shown that there has been no increase in dust levels off company property as a result of operations at the terminal. In 1992, the terminal processed 2.6 million tonnes of bituminous coal and lignite, about 800,000 tonnes of potash, and minor amounts of other products.

AIR QUALITY DATA FOR 1992

DUSTFALL

In 1992, monthly dustfall data were provided by Thunder Bay Terminals for sites 1,3,6 and 7, shown in Figure 1. Results (Table 1) show that at the location off company property (site 1), monthly dustfall exceeded Ontario's maximum acceptable limit of $7 \text{ g/m}^2/30 \text{ d}$ (grams of total dustfall per square metre for 30 days) for only one month. This exceedence may have been caused by local construction in progress at the time. On company property, dustfall was above the monthly objective for only 4 of 36 samples. The annual dustfall objective ($4.6 \text{ g/m}^3/30\text{d}$) was met at all sites, both on and off company property.

Average dustfall at the four monitoring sites in 1992 was similar to averages recorded for recent years (Table 2). No trends have occurred over the period monitored.

TOTAL SUSPENDED PARTICULATE MATTER (TSP)

Suspended particulate matter (TSP) comprises particles of small size which remain entrained in the air for long periods. TSP is more of a health-related contaminant than dustfall. TSP at three locations was measured for a 24-hour period every sixth day during 1992, using a standard high-volume sampler. Table 3 shows that during the year, TSP met the annual objective ($60 \mu\text{g/m}^3$) at both monitoring sites. There was only one exceedence of the daily objective ($120 \mu\text{g/m}^3$) off company property at site 1 (Sewage Treatment Plant), and three exceedences on property (site 3). Average TSP (Table 4) was similar to values recorded for many of the 16 preceding years; TSP levels showed no trend from 1976 to 1992.

CONCLUSIONS

Dustfall near Thunder Bay Terminals property substantially complied with Ontario's monthly objective in 1991. The single elevated reading was caused by temporary local construction, and was not due to emissions from the terminal. Suspended particulate matter, of more interest than dustfall for potential health impact, similarly complied with Ontario objectives off company property, except for one date when the daily objective was slightly exceeded.

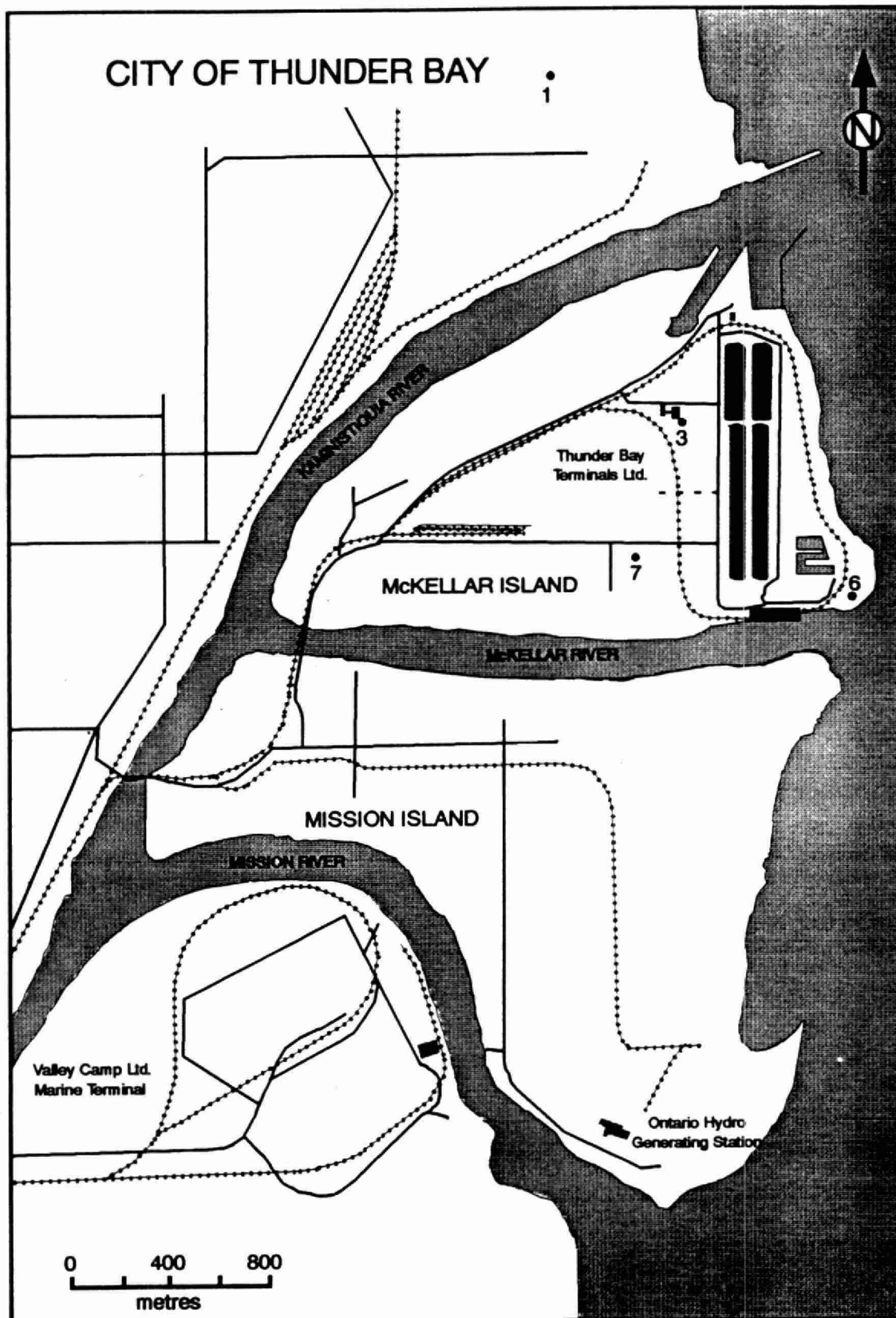


Figure 1. Air quality monitoring sites, Thunder Bay Terminals Limited.

TABLE 1. Total dustfall ($\text{g/m}^2/30$ days) near Thunder Bay Terminals Limited, 1992.

Site	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1	Sewage Treatment Plant	0.6	1.0	<u>8.0</u> ^b	4.9	1.7	3.8	4.7	3.5	5.7	3.3	1.5	3.2	3.5
3 ^a	Thunder Bay Terminals	0.9	1.2	2.5	<u>7.7</u>	3.7	3.0	<u>7.1</u>	2.7	2.9	2.4	6.8	1.6	3.5
6 ^a	Thunder Bay Terminals	1.3	1.2	2.1	4.5	1.1	2.7	<u>15.3</u>	3.2	3.7	3.8	<u>7.3</u>	4.8	4.2
7 ^a	Thunder Bay Terminals	0.5	1.6	2.2	1.5	3.1	2.6	3.6	3.4	2.5	1.2	6.7	1.8	2.6

^aSites on company property.

^bValues exceeding maximum acceptable levels of 7.0 (monthly) or 4.6 (annual mean) are underlined.

TABLE 2. Average annual dustfall ($\text{g/m}^2/30 \text{ d}$) near Thunder Bay Terminals Limited, 1980-1992.

Monitoring site	Location	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
1	Sewage Treatment Plant	2.5	2.1	2.8	3.4	3.6	<u>6.1</u> ^b	1.8	2.7	3.5	2.8	<u>5.0</u>	3.2	3.5
3 ^a	Thunder Bay Terminals	<u>5.2</u>	3.6	<u>4.7</u>	<u>8.2</u>	<u>5.0</u>	<u>8.1</u>	3.6	3.9	4.3	4.3	<u>5.2</u>	3.2	3.5
6 ^a	Thunder Bay Terminals	<u>8.5</u>	<u>6.9</u>	<u>8.8</u>	<u>19.5</u>	<u>15.3</u>	<u>15.7</u>	3.5	<u>5.1</u>	<u>4.7</u>	<u>4.9</u>	<u>6.2</u>	<u>5.3</u>	4.2
7 ^a	Thunder Bay Terminals	<u>7.9</u>	4.3	3.2	<u>16.1</u>	4.0	<u>7.2</u>	2.3	3.2	3.3	2.6	<u>5.1</u>	3.4	2.6
Averages		6.0	4.2	4.9	11.8	7.0	9.3	2.8	3.7	4.0	3.6	5.4	3.8	3.4

^aSites on company property.

^bValues above maximum acceptable level of 4.6 are underlined.

TABLE 3. Concentrations of total suspended particulate matter ($\mu\text{g}/\text{m}^3$) near Thunder Bay Terminals Limited, 1992.

Date	Monitoring Sites ^a		Date	Monitoring Sites ^a	
	1	3 ^b		1	3 ^b
Jan 1	19	18	Jul 5	61	99
7	9	9	11	50	85
13	55	52	17	9	11
19	21	27	23	9	13
25	32	43	29	56	67
31	37	43			
Feb 6	16	4	Aug 4	11	11
12	44	27	10	59	78
18	36	5	16	44	43
24	33	10	22	46	61
			28	81	55
Mar 1	18	41	Sep 3	46	42
7	11	36	9	22	12
13	84	72	15	41	76
19	76	59	21	32	51
25	70	53	27	30	23
31	62	86			
Apr 6	45	46	Oct 3	30	23
12	77	61	9	31	36
18	24	32	15	24	19
24	38	37	21	54	36
30	51	47	27	42	51
May 6	65	73	Nov 2	26	24
12	13	60	8	47	33
18	113	142	14	31	86
24	51	47	20	24	27
30	48	65	26	27	52
Jun 5	83	142	Dec 2	37	77
11	129	127	8	32	28
17	27	94	14	37	20
23	67	119	20	22	25
29	67	57	26	28	24
			Annual means:	36	39

^aSee Figure 1.

^bSite on company property.

TABLE 4. Annual geometric means ($\mu\text{g}/\text{m}^3$) of total suspended particulate matter near Thunder Bay Terminals Limited, 1976-1992.

Year	Sewage Treatment Plant (Site 1 ^a)	Thunder Bay Terminals (Site 3 ^a)
1976	41	47
1977	31	33
1978	27	34
1979	30	33
1980	28	33
1981	31	39
1982	28	32
1983	27	42
1984	38	59
1985	28	37
1986	34	49
1987	30	46
1988	34	50
1989	29	43
1990	32	36
1991	38	46
1992	36	39

^aSee Figure 1 for site locations.

ONTARIO



96936000008040

LE

~~CR.~~

DATE _____

ISSUED TO



—CAT. No. 23-115

PRINTED IN U. S. A.